

plurality of gas discharge holes through a gap between the dielectric material plate and the dielectric material shower plate;

a flat plate slot antenna being provided on an outer side of the chamber with the dielectric material plate interposed therebetween so as to supply a microwave for exciting plasma through the dielectric material plate;

an electrode being provided on an inner side of the chamber so as to hold the substrate to be processed;

a lattice-like shower plate provided between the dielectric material shower plate and the substrate to be processed so as to discharge a gas, which has a composition different from that of the gas discharged from the dielectric material shower plate, to a side of the substrate to be processed; and

at least a part of the gas discharged from the dielectric material shower plate flows to the side of the substrate to be processed by being passed through an opening part of the lattice-like shower plate,

wherein said lattice-like shower plate is formed of a metal pipe comprising a plurality of gas discharge holes configured and arranged such that the process gas is obliquely incident on the surface of the substrate.

2. (Amended) The plasma processing apparatus claimed in claim 1, wherein said plurality of gas discharged holes are provided to the metal pipe on a side facing the substrate to be processed, and the metal pipe is grounded.

3. (Amended) The plasma processing apparatus as claimed in claim 2, wherein said metal pipe is formed of a stainless steel containing aluminum, and a surface thereof is covered by a passivation film mainly formed of aluminum oxide.

4. (Amended) The plasma processing apparatus as claimed in claim 1, wherein said dielectric material shower plate and said lattice-like shower plate are arranged substantially parallel to each other, and a distance therebetween is substantially equal to a multiple of a quarter of a wavelength of said microwave in a vacuum. 30 mm

5. (Amended) The plasma processing apparatus as claimed in one of claims 1 to 4, wherein said dielectric material plate and said dielectric material shower plate are arranged substantially parallel to each other, and a distance between a surface of said dielectric material plate facing said slot antenna and a surface of said substrate to be processed is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part. 30 mm

6. (Amended) The plasma processing apparatus as claimed in claim 5, wherein said slot antenna and said dielectric material plate are arranged substantially parallel to each other, and a distance therebetween is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part. 30 mm

A1  
Cmt  
7. (Amended) The plasma processing apparatus as claimed in one of claims 1 to 4, wherein a thickness of said dielectric material shower plate is an integral multiple of a half of a wavelength of said microwave in a corresponding part. 20 mm

8. (Amended) The plasma processing apparatus as claimed in claim 7, wherein said slot antenna and said dielectric material plate are arranged substantially parallel to each other, and a distance therebetween is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part. 30 mm

5-17  
A2  
13. (Amended) A plasma processing apparatus for applying a process to a substrate to be processed, the plasma processing apparatus comprising:

a chamber of which interior can be depressurized;

a gas supply system constructed and arranged to supply a gas to the chamber and an exhaust system configured and arranged to exhaust the gas supplied to the chamber and to depressurize the chamber;

a part of a wall constituting the chamber being a flat plate dielectric material plate formed of a material which passes a microwave therethrough substantially without a loss;

a flat plate dielectric material shower plate, which is formed of a material which passes a microwave therethrough substantially without a loss, being provided between the dielectric material plate and plasma excited in the chamber;

a plurality of gas discharge holes being formed in the dielectric material shower plate so that at least a part of the gas supplied by the gas supply system is discharged through the plurality of gas discharge holes through a gap between the dielectric material plate and the dielectric material shower plate;

a flat plate slot antenna being provided on an outer side of the chamber with the dielectric material plate interposed therebetween so as to supply a microwave for exciting plasma through the dielectric material plate;

an electrode being provided on an inner side of the chamber so as to hold the substrate to be processed,

wherein the slot antenna, the dielectric material plate and the dielectric material shower plate are arranged substantially parallel to each, and a distance between a surface of the dielectric material plate facing said slot antenna and a surface of said dielectric material shower plate facing said substrate to be processed is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part. 30.7mm

14. (Amended) The plasma processing apparatus as claimed in claim 13, wherein a thickness of said dielectric material shower plate is an integral multiple of a half of a wavelength of said microwave in a corresponding part. 26mm

15. (Amended) The plasma processing apparatus as claimed in claim 13 or 14, wherein a distance between said slot antenna and said dielectric material plate is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part. 30mm

*See the attached Appendix for the changes made to effect the above claims.*

Please add the following new claims:

-- 16. (New) A plasma processing apparatus for applying a process to a substrate to be processed, the plasma processing apparatus comprising:  
a chamber of which interior can be depressurized,

a gas supply system constructed and arranged to supply a gas to the chamber and an exhaust system constructed and arranged to exhaust the gas supplied to the chamber and to depressurize the chamber;

a part of a wall constituting the chamber being a flat plate dielectric material plate formed of a material which passes a microwave therethrough substantially without a loss;

a flat plate dielectric material shower plate, which is formed of a material which passes a microwave therethrough substantially without a loss, being provided between the dielectric material plate and plasma excited in the chamber;

a plurality of gas discharge holes being formed in the dielectric material shower plate so that at least a part of the gas supplied by the gas supply system is discharged through the plurality of gas discharge holes through a gap between the dielectric material plate and the dielectric material shower plate;

427 a flat plate slot antenna being provided on an outer side of the chamber with the dielectric material plate interposed therebetween so as to supply a microwave for exciting plasma through the dielectric material plate;

an electrode being provided on an inner side of the chamber so as to hold the substrate to be processed;

AB  
cont a lattice-like shower plate provided between the dielectric material shower plate and the substrate to be processed so as to discharge a gas, which has a composition different from that of the gas discharged from the dielectric material shower plate, to a side of the substrate to be processed; and

at least a part of the gas discharged from the dielectric material shower plate flows to the side of the substrate to be processed by being passed through an opening part of the lattice-like shower plate,

wherein said dielectric material shower plate and said lattice-like shower plate are arranged substantially parallel to each other, and a distance therebetween is substantially equal to a multiple of a quarter of a wavelength of said microwave in a vacuum. 30 mm

17. (New) A plasma processing apparatus for applying a process to a substrate to be processed, the plasma processing apparatus comprising:

a chamber of which interior can be depressurized,

a gas supply system constructed and arranged to supply a gas to the chamber and an exhaust system constructed and arranged to exhaust the gas supplied to the chamber and to depressurize the chamber;

a part of a wall constituting the chamber being a flat plate dielectric material plate formed of a material which passes a microwave therethrough substantially without a loss;

a flat plate dielectric material shower plate, which is formed of a material which passes a microwave therethrough substantially without a loss, being provided between the dielectric material plate and plasma excited in the chamber;

a plurality of gas discharge holes being formed in the dielectric material shower plate so that at least a part of the gas supplied by the gas supply system is discharged through the plurality of gas discharge holes through a gap between the dielectric material plate and the dielectric material shower plate;

a flat plate slot antenna being provided on an outer side of the chamber with the dielectric material plate interposed therebetween so as to supply a microwave for exciting plasma through the dielectric material plate;

an electrode being provided on an inner side of the chamber so as to hold the substrate to be processed;

AB cut  
a lattice-like shower plate provided between the dielectric material shower plate and the substrate to be processed so as to discharge a gas, which has a composition different from that of the gas discharged from the dielectric material shower plate, to a side of the substrate to be processed; and

at least a part of the gas discharged from the dielectric material shower plate flows to the side of the substrate to be processed by being passed through an opening part of the lattice-like shower plate,

wherein said dielectric material plate and said dielectric material shower plate are arranged substantially parallel to each other, and a distance between a surface of said dielectric material plate facing said slot antenna and a surface of said substrate to be processed is substantially equal to an odd multiple of a quarter of a wavelength of said microwave in a corresponding part.

18. (New) The plasma processing apparatus as claimed in claim 17,  
wherein said slot antenna and said dielectric material plate are arranged substantially  
parallel to each other, and a distance therebetween is substantially equal to an odd multiple of  
a quarter of a wavelength of said microwave in a corresponding part. 30 mm

19. (Amended) The plasma processing apparatus as claimed in claims 16,  
wherein a thickness of said dielectric material shower plate is an integral multiple of a  
half of a wavelength of said microwave in a corresponding part. 20 mm

AB  
at  
20. (Amended) The plasma processing apparatus as claimed in claim 19,  
wherein said slot antenna and said dielectric material plate are arranged substantially  
parallel to each other, and a distance therebetween is substantially equal to an odd multiple of  
a quarter of a wavelength of said microwave in a corresponding part. -- 30 mm

---